



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,496	08/26/2003	Boris Glezer	03-127	5875

719 7590 09/22/2005

CATERPILLAR INC.
100 N.E. ADAMS STREET
PATENT DEPT.
PEORIA, IL 616296490

EXAMINER

KIM, TAE JUN

ART UNIT	PAPER NUMBER
----------	--------------

3746

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,496

Applicant(s)

GLEZER ET AL.

Examiner

Ted Kim

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 24, 27, 30 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 10-82527. JP '527 teaches a gas turbine combustor having a compressor for delivering compressed air to the engine, the combustor comprising: a combustion zone 16 for receiving a first portion of compressed air "a" from 27; a first liner 17 bounding said combustion zone, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector 37 (Fig. 12) spaced apart from said first liner, said first convector having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone and said first convector and creating with the first convector a defined volume for receiving a second portion of compressed air "a" from 35; a plurality of spiral passages between 37 positioned between the first liner and the first convector for causing the second portion of compressed air "a" from 35 to travel a distance greater than the defined distance between the end portions of the first liner and greater than the defined distance between the end portions of the first convector, and at least one cooling device included in said plurality of spiral passages, the at least one

cooling device selected from the group consisting of a dimple, a trip strip 29, a fin, and a pin; a turbine 13 in communication with the combustor. Note that while air “a” from 27 and air “a” from 35 may both mix and join to form a mixed air “a” downstream which enters the combustor, the claims do not differentiate from this occurring with the airflow.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

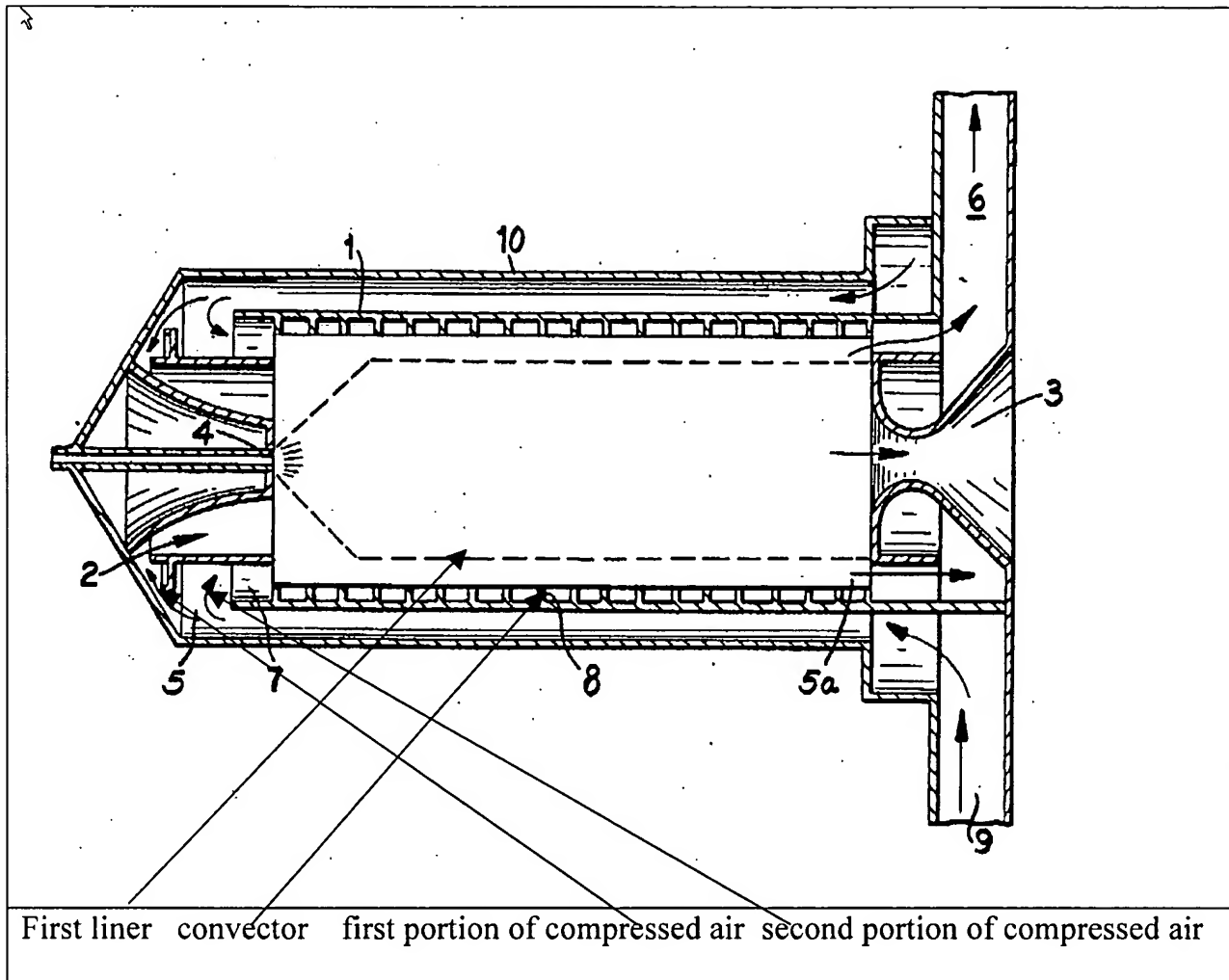
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 24, 25, 27, 28, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waeselynck (3,773,462) in view of either Lee et al (5,680,767) or Shoenman et al (5,737,922) and further in view of either Glezer et al (6,098,397) or JP 10-82527. Waeselynck teaches a combustor for a gas turbine engine having a compressor (inherent in a gas turbine engine, see the rest of the cited art which shows the compressor – alternately, this is obvious in view of any of Glezer or JP ‘527 which show the compressor is used for a gas turbine engine combustor) for delivering compressed air to the engine, the combustor comprising: a combustion zone for receiving a first portion of compressed air via 2; a first liner bounding said combustion zone, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector 8 spaced apart from said first liner, said first convector

having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone and said first convector and creating with the first convector a defined volume for receiving a second portion of compressed air (air is contemplated as entering 8, see col. 3, lines 40+ in which case the air near 7 would appear to enter 8); a plurality of spiral passages 8 positioned between the first liner and the first convector for causing the second portion of compressed air to travel a distance greater than the defined distance between the end portions of the first liner and greater than the defined distance between the end portions of the first convector. Waeselynck does not completely make clear where the source of air that enters 8. Shoenman et al teach it is old and well known in the art to employ a first source of compressed air 22 which enters the combustor and a second source of compressed air 56 which enters the cooling liner. It would have been obvious to one of ordinary skill in the art to employ the 2nd portion of air from within the flow from the compressor, as taught by Shoenman et al, as a well known technique for supplying combustor cooling air and/or as a convenient supply for the air for the combustor liner. Alternately, Lee et al teach a first source of compressed air from 246 to enter the combustor and a second source of cooling air from 126 and entering the cooling liner and also entering the combustor is old and well known in the art with benefits including maximizing the air available inside the combustion chamber and lower emissions (col. 2, lines 21-29). It would have been obvious to one of ordinary skill in the art to employ separate sources of compressor air delivered to the combustor in a manner disclosed by

Art Unit: 3746

Lee et al, to maximize the air available inside the combustion chamber and/or lower emissions. Waeselynck does not teach the at least one cooling device selected from the group consisting of a dimple, a trip strip, a fin, and a pin. However, Glezer teach cooling devices/dimples 84 as being effective for enhancing combustor cooling. JP '527 teach trip strips are effective for enhancing combustor cooling. It would have been obvious to one of ordinary skill in the art to employ further cooling devices to enhance combustor cooling. Waeselynck does not teach the number of helical passages being 3. However, finding the number of passages is regarded as an obvious matter of finding the workable ranges in the art. It would have been obvious to one of ordinary skill in the art to employ 3 helical passages, as being an obvious matter of using the workable ranges in the art.



5. Claims 24, 25, 27, 28, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-82527 in view of Lee et al (5,680,767). JP '527 teach two sources of compressed air. An alternative treatment of the two sources of compressor air is made below. Lee et al teach a first source of compressed air from 246 to enter the combustor and a second source of cooling air from 126 and entering the cooling liner and also entering the combustor is old and well known in the art. The second flow is a reverse air flow design analogous to the JP '527 design with benefits including maximizing the air available inside the combustion chamber and lower emissions (col. 2,

lines 21-29). It would have been obvious to one of ordinary skill in the art to employ separate sources of compressor air delivered to the combustor in a manner disclosed by Lee et al, to maximize the air available inside the combustion chamber and/or lower emissions. JP '527 do not teach the number of helical passages being 3. However, finding the number of passages is regarded as an obvious matter of finding the workable ranges in the art. It would have been obvious to one of ordinary skill in the art to employ 3 helical passages, as being an obvious matter of using the workable ranges in the art.

6. Claims 26, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the art applied above in view of Liebe (6,341,485). The above prior art do not teach a second liner and second convector, i.e. an annular combustor arrangement. Liebe teaches spiral cooling channels in a cylindrical combustor (Fig. 1) and an annular combustor (Figs. 6, 7) have similar arrangements for the first liner/convector and the second liner/convector. It would have been obvious to one of ordinary skill in the art to apply the spiral cooling channels of the prior art in an annular combustor and thus have both similar first liner/convector and the second liner/convector, as taught by Liebe, in order to utilize a well known combustor cooling technique to annular combustors.

Response to Arguments

7. Applicant's arguments in view of the amended claims filed 07/25/2005, with respect to Farlow, Shekleton, Ross, Schirmer, and Liebe under 35 USC 102 have been fully considered and are persuasive and these rejections have been withdrawn.

8. Applicant's arguments are not persuasive with regard to JP '527 as the claims are not differentiated from JP '527 which does teach two sources of compressed air. For the Waeselynck reference, applicant's remarks have been considered but are not persuasive as the disclosure as a whole must be evaluated rather than taking these portions of the specification out of context (col. 1, lines 21-24). Waeselynck clearly teaches in the section immediately following col. 1, lines 21-24 that the internal wall of the enclosure is lined with a refractory material, the refractory lining comprise sections of helical fins. Later in col. 3, lines 1-42, it is made abundantly clear that the combustor wall/liner separates the hot combustion gas from the coolant (see e.g. col. 3, lines 34+). Thus, the examiner's position is that the liner of the combustor is that which immediately separates the hot combustion gases from the coolant. Consequently, it would appear that the portions of the specification applicant is referring to refer to improvements vs. other kinds of combustor geometry. Hence, the examiner's interpretation relies on the plain meaning of the disclosure and drawings.

9. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Art Unit: 3746

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

 Ted Kim	Telephone	571-272-4829
Primary Examiner	Fax (Regular)	571-273-8300
September 19, 2005	Fax (After Final)	571-273-8300
Technology Center 3700 Receptionist	Telephone	703-308-0861
Patents Assistance Center	Telephone	800-786-9199